period of a solar rotation at the equator as determined from the faculæ is 24.64 days. The order of rapidity of rotation is faculæ, then spots, and last the stratum in which the dark lines are produced which were used by Dunér in his spectroscopic determination of the solar rotation.

THE first volume of the Publications of the Zurich Observatory has appeared, aided by a publication fund bequeathed by the late Director, Professor Rudolph Wolf. It contains the observations by Professor Wolfer, now Director, on the solar surface in the years 1887–89. The introduction of photographic methods has not detracted from the value of systematic visual observations of solar phenomena. At Zurich these observations have long been a specialty. Spots, faculæ and prominences are included in the observations, which are given in detail with location in heliographic latitude and longitude, followed by charts graphically indicating the distribution. It seems that the faculæ in the years 1887–89 had a tendency to develop in two special regions of solar longitude nearly diametrically opposite to each other. In a less degree this is shown by the spots, and somewhat by the prominences. The Publication is handsomely printed.

E. B. F.

NOTES ON INORGANIC CHEMISTRY.

MANGANESE salts in which the metal is trivalent are known, but they are few in number, and all are decomposed by contact with water. In the last *Journal of the Chemical Society*, C. E. Rice describes two double manganic chlorids, $MnCl_3.2NH_4Cl.H_2O$ and $MnCl_3.2KCl.H_2O$, which are stable up to the temperature of 100°. They are formed by dissolving the higher oxids of manganese in fuming hydrochloric acid, immersed in a freezing mixture and adding a solution of ammonium or potassium chlorid. The compounds form minute transparent crystals transmitting ruby-colored light. They dissolve in hydrochloric acid to a dark solution, but are decomposed by water. The analogy of manganese to iron is shown by the fact that the crystals are apparently isomorphous with $FeCl_3.2NH_4Cl.H_2O$ and $FeCl_3.2KCl.H_2O$. The chlorid $MnCl_3$ could not be isolated, and there was no evidence of the formation of any $MnCl_4$.

THE last number of the *Chemical News* reprints an article from the *Proceedings* of the Australasian Association for the Advancement of Science, by Professor Liversidge, of the University of Sydney, on the corrosion of aluminum. Two shallow dishes of ordinary sheet aluminum 1 mm. thick were exposed on the laboratory roof for over a year. Rain water caught in the dishes so that they were exposed to the action of any dissolved salts of the atmosphere. The metal soon lost its brilliancy, became gray and rough, and the incrustation did not wash off and could not be rubbed off by a cloth. The dishes increased in weight somewhat less than one per cent. The tarnish was probably due to the formation of a hydrated oxid of aluminum. The tarnish must be comparatively superficial considering the small increase in weight in over a year's exposure. It is, however, clear that the statement frequently found in books that aluminum is unaltered by exposure to the air is not true of the commercial metal, whatever may be the case with the chemically pure metal. In another experiment by Professor Liversidge a sheet of aluminum 1 mm. thick and of 24 square inches' surface was dipped in a solution of salt almost daily for three months, each time being allowed to dry. The plate lost 0.1% in weight, and after washing and rubbing dry 0.3%, showing comparatively little corrosion.

J. L. H.